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Veterinary hygiene

A GUIDELINE FOR VETERINARY PRACTICES

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Veterinary hygiene – a guideline for veterinary practices

Katariina Thomson and Hanna Aaltonen

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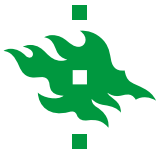

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Abstract

This guide has been drafted as a concrete protocol of the National Action Plan on Antimicrobial Resistance in order to provide practical assistance for the development of hygiene practices at veterinary receptions and prevent the spread of antimicrobial resistance.

Increasing antimicrobial resistance is one of the biggest national health threats in the world. The antimicrobial resistance of pathogenic bacteria in animals is also increasing at an alarming rate. Reducing the use of antimicrobials mitigates the development of resistance and improving the level of hygiene at veterinary receptions can also effectively prevent infections and the spread of antimicrobial resistance.

Daily hygiene procedures and taking standard precautions form the basis for preventing infections. These precautions must be taken with each and every patient by all reception personnel. Proper hand hygiene is the foundation of hygiene protocols. In addition to proper hand hygiene, hygiene protocols and standard precautions include aseptic technique, the proper use of personal protection equipment, the immediate cleaning of secretions, the prevention of needle stick and cutting injuries, and maintaining reception tidiness and cleanliness.

Furthermore, special attention must be given to the treatment and handling of risk patients, i.e. potential carriers of resistant bacteria and animals with contagious diseases. The identification of risk patients, choosing the right treatment room and treatment planning at the reception are crucial to avoiding contamination of the facility and the spread of infection transmitted by the hands of personnel, the environment and the equipment used. This guide will help point out essential factors in the planning of hygiene protocols at different veterinary receptions.

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Tämä opas on laadittu Suomen mikrobilääkeresistenssin torjunnan kansallisen toimintaohjelman konkreettisena toimenpiteenä tuomaan käytännönläheistä apua eläinlääkärien vastaanottojen hygieenisen toiminnan kehittämiseksi ja mikrobilääkeresistenssin leviämisen ehkäisemiseksi.

Kasvava mikrobilääkeresistenssi on yksi maailman suurimmista kansanterveyden uhista. Myös eläimille infektioita aiheuttavien bakteerien mikrobilääkeresistenssi lisääntyy huolestuttavasti. Mikrobilääkkeiden käytön vähentäminen hillitsee resistenssin kehittymistä ja sen lisäksi myös eläinlääkärien vastaanottojen hygieniaa parantamalla voidaan tehokkaasti ehkäistä infektioiden syntymistä ja mikrobilääkeresistenssin leviämistä.

Päivittäinen hygieeninen toiminta ja tavanomaisten varotoimien noudattaminen on tartuntojen ja infektioiden ehkäisemisen perusta. Näitä varotoimia tulee toteuttaa jokaisen potilaan kohdalla kaikkien vastaanotolla työskentelevien toimesta. Hyvä käsihygienia on hygieenisen toiminnan perusta. Asianmukaisen käsihygienian lisäksi hygieeniseen toimintaan ja tavanomaisiin varotoimiin kuuluvat aseptinen työskentely, oikeaoppinen suojainten käyttö, eritetahrojen välitön siivoaminen, pisto- ja viiltotapaturmien ehkäisy sekä vastaanoton siisteyden ja puhtauden ylläpito.

Lisäksi on kiinnitettävä erityistä huomiota riskipotilaiden, eli mahdollisten resistenttien bakteerien kantajien ja tarttuvaa tautia sairastavien eläinten käsittelyyn vastaanotolla. Riskipotilaan tunnistaminen, sopivan hoitotilan valitseminen ja hoidon suunnittelu vastaanotolla on tärkeää jotta vältetään tilojen kontaminoituminen ja tartunnan leviäminen niin henkilökunnan käsien, kuin ympäristön ja välineidenkin välityksellä. Tämä opas auttaa huomioimaan olennaiset tekijät erilaisten eläinlääkärivastaanottojen hygieenisten toimintatapojen suunnittelussa.

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Referat

Denna guide är en konkret åtgärd som tagits fram utgående från det nationella handlingsprogrammet mot antimikrobiell resistens. Den ger praktiknära hjälp för att utveckla hygienen på veterinärmottagningar och bekämpa antimikrobiell resistens.

Den ökade antimikrobiella resistensen är ett av de största hoten mot folkhälsan i världen. Antimikrobiell resistens hos bakterier som orsakar infektioner hos djur ökar också oroväckande snabbt. Att minska användningen av antimikrobiella läkemedel motverkar utveckling av resistensen. Bättre hygien på veterinärmottagningar förebygger också effektivt uppkomsten av infektioner och spridningen av resistenta bakterier.

Att etablera dagliga hygienrutiner och följa basala hygienrutiner är det grundläggande sättet att förebygga smitt- och infektionsspridning. Alla som arbetar på mottagningen ska följa dessa försiktighetsåtgärder med alla patienter. Bra handhygien är grunden för en hygienisk verksamhet. Till en hygienisk verksamhet och basala hygienrutiner hör också aseptiskt arbetssätt, användning av skyddsutrustning, omedelbar avlägsning av sekret, förebyggande av stick- och skärsår samt städning och rengöring av mottagningsrummen.

Dessutom ska man vara särskilt försiktig när man behandlar riskpatienter, det vill säga djur som eventuellt bär på resistenta bakterier eller har en smittsam sjukdom, på mottagningen. Det är viktigt att man identifierar riskpatienterna, väljer ett lämpligt vårdrum och planerar vården på mottagningen. Detta i syfte att undvika kontaminering av rummen och spridning av smittan via personalens händer, miljön och instrumenten. Denna guide hjälper att ta hänsyn till de faktorer som är väsentliga när man planerar hygieniska arbetssätt på olika veterinärmottagningar.

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FOREWORD

The growth of antimicrobial resistance is a global problem. It is a good thing that information on the matter has been provided and common objectives have been set by international organisations and advisory bodies.

Strategic objectives require effective implementation. International action plans must be based on wide-ranging expertise and co-operation. Ultimately, the deciding factor is how effectively these objectives can be put into actual practice. In some cases, these practices are based on a large volume of scientific research and risk assessment. In others, it is a matter of improving on the fundamentals, i.e. replacing old and familiar working methods with new ones.

The hygiene guide for veterinary receptions being published here is an excellent example of both these points. Well-established routines in daily work play a key role, along with the long-term scientific monitoring of bacteria-resistance and advanced diagnostics.

On behalf of the Ministry of Agriculture and Forestry, I would like to thank the authors for their expert and enthusiastically written guide. I am sure that it will provide practical information on how to improve hygiene at receptions, while mitigating the spread of antimicrobial resistance.

Jaana Husu-Kallio

Permanent Secretary

PREFACE

This guide has been developed as part of the National Action Plan on Antimicrobial Resistance to provide practical support to allow veterinary practices to develop their own hygiene policies and protocols. The project has been funded by the Ministry of Agriculture and Forestry. It received additional financial support from the Finnish Veterinary Association, which made it possible for a Finland-wide roadshow to be run in 2018–2019.

Growing antimicrobial resistance (AMR) is one of the most significant threats facing public health globally. Reducing the use of antimicrobials will slow down the development of resistant strains. It is therefore imperative that fewer antibiotics are prescribed in settings where infections can be prevented through improved hygiene precautions.

In Finland, levels of antimicrobial prescribing for companion animals are one of the lowest in Europe but significantly higher than in the neighbouring Sweden and Norway, for example Staphylococci, Enterobacterales and other bacterial isolates found in Finnish pets tend to be more resistant to antimicrobials than those found in Sweden. Higher levels of antimicrobial use are largely a matter of habit, but increased resistance leads to more widespread use of broad-spectrum antibiotics when first line alternatives fail to achieve the desired outcome

It is important that veterinary practices take action to prevent the spread of infectious disease to ensure animal welfare, to deliver high standards of workplace health and safety and also to safeguard their professional reputations. Effective action on hygiene can prevent healthcare-associated infections and encourage veterinary practitioners to consider non-antimicrobial treatment options. Robust infection prevention and control measures, reliable diagnostic systems and an awareness of associated risks all play a key role in reducing and driving more targeted antimicrobial use.

This guide is intended as a practical handbook for veterinary practices in Finland. It is designed to promote hygienic working practices, reduce the incidence of healthcare-associated infections, help veterinary practitioners to identify high-risk patients and to

provide them with guidance on the use the appropriate personal protective equipment. The information in this guide is applicable in a variety of different situations and contexts, and readers are encouraged to make use of the ideas and solutions best suited to their own particular circumstances.

The views of experts in veterinary and human medicine were sought as part of a public consultation process. Formal requests for consultation responses were also sent to the following organisations:

Animal Health ETT
Evidensia Oy
Finnish Medicines Agency (Fimea)
Ministry of Agriculture and Forestry
Omaeläinklinikat Oy
Permanent Working Group on Antimicrobials
Finnish Food Safety Authority (Evira)
Finnish Veterinary Association
Finnish Association of Veterinary Practitioners
Suomen Klinikkaeläintenhoitajat ry
Suomen Kunnaneläinlääkäriliitto ry
Finnish Society for Hospital Infection Control
Suomen Yksityiset Eläinlääkärit ry
Finnish Institute for Health and Welfare (THL)
Finnish Association for Food Animal Practitioners

The guide was written by Katariina Thomson (DVM, PhD) and Hanna Aaltonen (MSc (Health Sciences).

Thomson served as an infection control officer at the University of Helsinki Veterinary Teaching Hospital, both in a full time capacity and later in addition to other responsibilities. She wrote her dissertation on the use of antimicrobials on animals in Finland and, throughout her career, has had a particular interest in antimicrobial resistance and prevention. Thomson has lectured and consulted on the use of antimicrobials and veterinary treatment hygiene in Finland and abroad for more than 10 years. She has also served on a Finnish Food Safety Authority (Evira) working group appointed to develop recommendations on the prudent use of antimicrobials in veterinary medicine.

Aaltonen served for many years as head nurse at the Veterinary Teaching Hospital's Small Animal Hospital Surgical Unit, where she completed her hygiene nurse studies in addition to her normal work duties. She has played a key role in developing hygiene protocols for the Veterinary Teaching Hospital and has extensive experience of delivering training courses to promote good hygiene practices within the profession. Having earned a Master's degree in Health Science, she is currently teaching at the Hyria Education University of Applied Sciences.

Helsinki, 28 August 2019

Katariina Thomson DVM, PhD
Hanna Aaltonen, MSc (Health Sciences)

DEFINITIONS AND ABBREVIATIONS

Bacterial strain	A strain is a bacterial sub-type that may assist in identifying an epidemiological link between patients.
Colonisation	Asymptomatic carriers. Colonisation can be confirmed through a mucosal, skin or stool sample. Carriers of multidrug resistant bacteria are at an increased risk of acquiring an infection caused by these bacteria.
Contact isolation	Patients are segregated from other patients, and PPE is worn to prevent contact transmission.
Contact transmission	Transmission occurs through direct or indirect contact, mainly though the hands of people caring for animals but also via shared medical supplies and the wider care environment.
Double isolation	Patients with an infectious disease are segregated from other patients but are also susceptible to HAIs due to underlying medical conditions.
Droplet transmission	Microbes are transmitted by droplets emitted when animals cough, sneeze or bark.
Extended Spectrum Beta Lactamase	ESBL is produced by certain gram-negative gastrointestinal bacteria. This enzyme confers resistance to beta-lactam antibiotics.
Healthcare-associated infections	HAIs occur during treatment or are linked to medical procedures.
Minimum Inhibitory Concentration	MIC is the lowest concentration of an antimicrobial to inhibit the visible growth of a microorganism.
MRSP and MRSA	Methicillin-resistant *Staphylococcus pseudintermedius* or *Staphylococcus aureus*. These bacteria are resistant to all beta-lactam antimicrobials and can also be multi-drug resistant.
Multi-drug resistant (MDR)	A microbe that is resistant to several different classes of antimicrobial drugs.
Problematic microbes	This term generally refers to bacteria that are resistant to multiple antimicrobials and are easily transmitted from one patient to another or to staff via equipment and medical instruments. These microbes can survive well on inanimate surfaces and cause infections that are difficult to treat.
Protective isolation	Patients that are particularly susceptible to HAIs, including patients with severe neutropaenia, are treated separately from other patients.
Resistance profile	Details the sensitivity of bacteria to antimicrobial agents.
Screening sample	A swab taken from, for example, a mucosal surface to test for multi-drug resistant bacteria.
Standard hygiene precautions	Standard precautions or procedures; used in the treatment of all patients.
Surfactant	Surfactants (surface active agents) are used in detergents to help remove dirt and grease.
Virulence	A pathogen's propensity to cause disease.

1 Routes of transmission

Microbes can be transmitted by a number of different routes, including through contact, droplets and aerosols. Many diseases, including Leishmaniasis and Lyme Disease, are transmitted by vectors.

1.1 Contact transmission

Contact transmission occurs directly between patients, like when two dogs greet one another or when a dam licks her puppies. Contact transmission can also happen indirectly via medical equipment, surfaces, hands or within the wider clinical setting.

In the veterinary setting, transmission tends to most commonly happen through the hands of veterinary staff if careful hand hygiene is not observed. Body fluids, including wound exudate and faecal matter, harbour high levels of microbial contamination. When staff come into contact with patients, their hands become contaminated with microbes which are then transmitted to surrounding surfaces and to other patients. To prevent the spread of infectious diseases, it is vitally important that alcohol-based hand rub is used before and after every episode of direct patient contact. If you come into contact with blood or body fluids or you are attending to a patient that is bleeding or emitting body fluids, it is extremely important to wear gloves and observe good hand washing technique.

1.2 Droplet and aerosol transmission

Droplet transmission occurs when animals cough, sneeze or bark. This allows pathogens to be propelled to a distance of usually around one metre from the patient. When they are seeing patients, staff can also become exposed to pathogens when performing procedures where the risk of blood or body fluids becoming aerosolized is high. These include

dental procedures, ear flushing, wound lavage or when the animal is being cleaned. It is essential that you wear personal protective equipment, including coat, face mask, eye protection and surgical cap or other head covering, when undertaking this type of work.

1.3 Notes on infectivity

Different types of microbes cause different types of problems. With some, infection is limited to just one individual and the disease is not likely to spread to other animals or humans. Some pathogens transmit among only one animal species. From a health and safety perspective, zoonotic diseases pose the greatest challenge for veterinary practices, as they can also be transmitted to staff. Virulence can vary between strains but, as a rule, microbes are transmitted directly or indirectly between animals or they have zoonotic potential. Appendix 1 lists a selection of different pathogens, their modes or transmission, their zoonotic potential, precautions to be taken and notes on cleaning techniques. Appendix 2 provides information on pathogen survival times on inanimate surfaces and in different ambient conditions.

2 Hygienic working practices

SUMMARY

- Having hygienic working practices in place means that you observe certain standard precautions at your workplace every day. This is the single most important infection control activity you can undertake. The precautions must be observed by all staff in respect of all patients that attend your practice.
- Effective hand hygiene is the cornerstone of hygienic practice.
- Hygienic working practices include aseptic techniques, the correct use of personal protective equipment, the prompt cleaning of any blood or body fluids, preventing sharps injuries and ensuring that your premises are clean and tidy at all times.
- All staff are required to protect themselves and their patients from infectious diseases.

Effective hand hygiene

You should wash your hands:

- when they are visibly soiled or dirty
- before coming to work and before eating, when leaving work and after using the toilet
- always use water and liquid soap to wash your hands

You should disinfect your hands:

- before and after coming into direct contact with a patient
- before undertaking procedures requiring aseptic technique
- before and after using protective gloves
- after coming into contact with the patient environment
- always use alcohol-based hand rub
- two pushes will dispense 3–5 ml of the hand rub, continue rubbing your hands together until it has evaporated completely

Gloves and other types of PPE:

- should always be disposable
- new PPE should be worn for every procedure and patient
- are not a substitute for good hand hygiene

The range of zoonotic pathogens capable of causing human disease found in Finland has grown in recent years. Animals brought into the country from abroad can carry infectious diseases that are not found in native species. Some of these diseases, including Canine Distemper, remain well-controlled thanks to high vaccination coverage. Due to the increasing volume of animal imports into Finland, Rabies, the most serious of the animal-to-human transmitted pathogens that pose a health risk to humans should again be viewed as a workplace health and safety issue. The numbers of multi-resistant bacteria have also grown in recent years and this development is associated with an increase in broad-spectrum antibiotic prescribing.

Staff treating animal patients must remain aware of the risks associated with this activity and ensure that they appropriately protect themselves against infection. By taking the necessary precautions, you are also protecting your patients.

The Finnish Occupational Safety and Health Act (738/2002) places a duty on all employers to ensure the occupational health and safety of their workforce and on employees to protect themselves against serious diseases. The employer must provide the appropriate personal protective equipment and train staff to use them correctly. Employers can use this guidance to provide training on safe working practices. Employees are responsible for using the personal protective equipment provided to them by their employer and for maintaining such order and cleanliness as well as exercising such care and caution as is necessary for the purposes of ensuring workplace health and safety. You should treat all patients as potential carriers of infectious diseases or problematic microbes.

Infection control measures on hygiene are designed to prevent animal-to-animal, animal-to-human and human-to-animal disease transmission. These precautions must be followed by all staff providing care to animal patients.

A healthcare-associated infection (HAI) is an infection that was not present on admission. Surgical site infections are the most common type of healthcare-associated infection. Other types of HAI include post-surgical pneumonia, in-patient and post-discharge UTIs and canine infectious tracheobronchitis or kennel cough, which can be contracted by dogs sharing a ward with infected animals.

The correct use of aseptic technique and maintaining a high standard of hygiene help to prevent healthcare-associated infections. All HAIs must be carefully monitored to ensure high standards of care are maintained. Patients with post-surgical infections should always be kept under active review. If you suspect a surgical-site infection, take a sample for microbiological analysis. It is essential that all HAIs and related bacterial findings are carefully documented so that any outbreaks can be identified. Poor record keeping can result in unnecessary delays.

Routine infection control precautions on hygiene and aseptic technique should be observed with every patient, regardless of whether infection is known to be present or not. The precautions comprise hand hygiene, using personal protective equipment, managing spillages of blood and body fluids and aseptic technique.

2.1 Personal protective equipment

2.1.1 Staff uniforms

Uniforms must always be worn by staff taking part in direct patient care activities / direct clinical care. The uniforms must be machine washable and able to withstand high temperatures and disinfectant detergent. The uniform should consist of trousers and a short-sleeved tunic or coat with sleeves that can be rolled up above the elbow when seeing patients. Shoes must be robust safe to wear and offer good support to your foot. You should also ensure that they can be cleaned and disinfected when required. Uniforms should be changed regularly and whenever they become soiled. Long-sleeved tops, including traditional "white coats", prevent effective hand hygiene, as they stop you from washing your wrists and forearms properly. Long sleeves are also liable to become contaminated in the course of clinical activities and can help transmit infectious agents. Long hair should be worn tied up.

2.2 Hands and skin – maintaining good hand hygiene

In the veterinary setting, a significant percentage of infections are transmitted through hand contact. Hand hygiene means taking care of your skin, using alcohol-based hand rub and, where indicated, washing your hands with soap and water. For all direct patient care activities, follow the "nothing below the elbows" principle to support effective hand hygiene. Rings, watches, bracelets and fitness and activity trackers should not be worn. You should look after your skin by regularly cleaning your hands and forearms with plenty of alcohol hand rub and by regularly applying moisturiser to these areas. If your skin is dry and cracked, it's a good idea to apply a generous layer of moisturiser and wear a pair of cotton gloves overnight to help absorption. You should always keep your nails short. As a rule of thumb, you should not be able to see any nail with your palm turned up. False nails, gel nails, nail extensions and nail varnish must not be worn as they prevent you from exercising effective hand hygiene and can harbour micro-organisms when cracked.

Tattoos, when fully healed, do not impede effective hand hygiene. However, a new tattoo on the hands should be treated as any non-intact skin, this means that you should not take part in direct patient care activities until it is fully healed. A dressing should be

worn on any new tattoos elsewhere on the body until the skin has healed. Piercings are permitted, provided that they do not stop you from observing hygienic working practices and the skin is fully healed.

Hand hygiene is a particularly effective way to prevent the spread of infections. The purpose of hand hygiene is to reduce the transmission of microbes between staff, patients and the physical environment. You should disinfect your hands before and after patient contact, before carrying out aseptic procedures, including phlebotomy, cannulation, intubation, catheter insertion and handling and dispensing, before and after direct contact with inanimate surfaces, including keyboards, telephones, medical devices, cupboards, door handles, drawers, and before and after putting on gloves. When you're at work, you should constantly be aware of your hand hygiene and always disinfect your hands when moving on to a new task.

2.2.1 Hand washing

Hands should be washed with lukewarm water and liquid soap only when they feel unclean or are visibly dirty. They must also be washed after contact with blood and body fluids and using the toilet, before eating and on arrival and departure from the workplace. As animal skin tends to be oilier than human skin, veterinary staff may need to wash their hands more frequently than staff working in human medicine.

Hands should be washed for at least 30 seconds. Use lukewarm water and liquid soap. Hands must be dried thoroughly with a disposable paper towel, and you should also use these to turn off the tap when finished. Alcohol-based hand rubs usually contain glycerine and other moisturizing agents. They should always be applied to dry skin after hand washing to moisturise skin.

2.2.2 Disinfection

Disinfection using an alcohol hand gel is quicker, more effective and kinder to skin than using soap and water. Alcohol-based hand rub is an important part of all direct patient care activities and an effective way to prevent the spread of infections. Alcohol-based hand rub eliminates transient flora picked up from patients and any contaminated environment but does not affect resident flora or lead to resistance. Many of the products sold in Finland contain humectants like glycerine that do not evaporate with the alcohol. With glycerine to soothe and hydrate the skin, it is possible to use alcohol-based hand rub frequently without the skin drying out.

Hand disinfection must be carried out using the correct technique. Dispense two doses of alcohol-based hand rub into dry hands. This equates to approximately 3–5 ml of product. Start with the fingertips and then scrub all hand surfaces; fingers, between the fingers, palms, backs of the hands and wrists. Finally, run the back of your fingers against your palms. Rub hands together for 20–30 seconds or until completely dry. Do not dry your hands while using the alcohol hand rub as this will reduce its efficacy.

To ensure effective hand disinfection, ensure that sufficient numbers of alcohol hand rub dispensers are available for staff. Make sure they are positioned in a way that means they are convenient to use, and staff disinfect their hands before every episode of patient contact. In the clinical environment, dispensers should be sited no more than (2) metres apart. A number of different designs are available, and it is a good idea to consider which types are best suited to your premises. In addition to wall-mounted dispensers, pump bottles should be made available on all available countertops, shelves, desks and clinical trollies. Brackets for alcohol-based hand rub can also be added to kennel doors.

2.3 Personal protective equipment

The purpose of personal protective equipment (PPE) is to offer the wearer protection against micro-organisms carried by patients and, conversely, to protect patients against micro-organisms present in the clinical environment and on staff hands. It's important that PPE is handled, put on and removed correctly. After an episode of care has been completed, used PPE must be discarded immediately and placed in the appropriate waste bin. Always disinfect hands before handling PPE items to prevent the containers from becoming contaminated. Hands should also be disinfected after PPE has been removed as gloves can become damaged during use and the wearer's hands may become contaminated. Coats and coveralls must be taken off by turning them inside out to ensure that your uniform remains clean. In terms of health and safety at work, it is important to ensure that the correct PPE is worn as some pathogens may be zoonotic. The most common PPE includes gloves, coats, coveralls, aprons, surgical masks, caps, goggles, visors and protective shoes.

2.3.1 Gloves

Medical gloves used in direct patient contact must conform to European Standard EN 455 (medical gloves for single use) (Finnish Institute of Occupational Health 2018). Gloves are worn to protect healthcare professionals and patients from cross-transmission of micro-organisms through contaminated hands. Gloves are single use items and they must not be washed or disinfected. They should be changed between every episode of patient contact

and between patients, and it may be necessary to change gloves between different care activities. Always disinfect and allow hands to dry fully before putting on gloves. This is necessary because there may be microscopic holes in the gloves and disinfection is necessary to ensure that your hands are completely clean. It also means that the box containing the gloves does not become contaminated. Gloves are not a substitute for effective hand hygiene.

Gloves must be changed between patients. They should be removed after each patient and hands must be always disinfected after their removal. It may be necessary to replace them with a new pair of gloves immediately. Gloves must be worn with all patients when contact is anticipated with mucous membranes, non-intact skin, ears, rump, blood or body fluids. Gloves must also be worn for aseptic procedures, including when handling catheters and cannulas and during wound care. Gloves are also recommended for oral examinations, phlebotomy, intubation, cleaning and when taking a temperature.

2.3.2 Gowns, coveralls and aprons

Gowns, coveralls and aprons are worn to ensure uniforms do not become soiled and to prevent the transmission of infectious diseases. All PPE worn over or in addition to uniforms must be single use and changed for each patient. Hands must be disinfected before and after wearing PPE.

Aprons can be worn to protect uniforms during preoperative grooming including clipping and while the surgical site is washed and disinfected. Aprons are also convenient when dealing with feline patients. Long-sleeved plastic protective aprons are ideal for patients suffering from diarrhoea or wounds with discharge. Gowns made from a nonwoven fabric offer protection to the wearer's arms and the back of their uniform but are not moisture-resistant. Protective coveralls are practical when working with large patients and/or when patient care involves dealing with large volumes of blood or body fluids. They are more durable and offer better protection against moisture and liquid splashes than gowns. They also cover the wearer's hands, legs from knee to ankle and, as they are hooded, can be used to cover hair if required.

2.3.3 Surgical masks, medical caps and eye protection

Surgical masks must be worn for all patient care activities involving splashing, spraying or aerosols, including ear flushing and dental procedures. It may also be necessary to wear goggles or visors to offer protection to the eye area or to protect hair with a medical cap.

Surgical masks are also used to offer protection to patients when performing aseptic procedures. In the surgical ward, masks must be worn during surgical site cleaning and disinfection, and in the operating theatre masks must be worn for the full duration of the clinical procedure. Their integrity can become compromised over time and it may be necessary to replace them during longer operations (> 2 hours).

Surgical mask must always be worn when delivering care to patients with a suspected zoonotic disease that can spread through the mucosa (see Appendix 1).

Medical caps should be worn by all staff at the surgical ward to prevent lose hair and skin scales from entering the prepared surgical site or the incision. The cap will also protect staff from splashing or spraying.

2.3.4 Protective footwear

Protective footwear should be worn in isolation facilities or if a patient is being looked after in a clinical area and they are suffering from diarrhoea or urinary incontinence. When protective footwear is worn, regular work shoes remain unsoiled. Protective footwear must be easy to clean. Machine washable gardening clogs are a good alternative. Do not use shoe covers as they are easily compromised and may be slippery. Putting them on and removing them can lead to hands becoming contaminated, which requires particular vigilance with regard to hand hygiene.

2.4 Aseptic technique

Aseptic technique is designed to prevent microbial contamination and involves staff completing "clean" tasks before moving onto "dirty" tasks. The principles of asepsis must be adhered to during all direct patient care both in respect of each individual patients and all patients seen in the course of a day. Forward planning is vital to aseptic technique. Where practicable, all procedures should be planned in advance and the equipment required to carry them out should be set out in preparation. During direct patient contact, aseptic technique should always be observed, and particular care should be taken to ensure that clinical activities are undertaken in the appropriate order, starting with the head and progressing towards the tail.

Aseptic technique must be observed for all medical procedures. For example, when performing cannulation, staff should always use a clipper with a clean and sharp blade to prevent damage to skin. Always disinfect hands before cleaning the patient's skin with alcohol. The cannula should only be handled after hands have been disinfected,

and gloves should be worn where indicated. Gloves are always recommended to prevent unprotected direct contact with blood. Medical equipment should never be placed on the floor. It should always be placed on a table on a surgical sheet, kidney dish or instrument tray. Under no circumstance must any part of the equipment, such as the stylet, be placed in the mouth. The tape used to secure the cannula must be clean and it should be replaced at least once a day. The skin around the cannula should be cleaned when new tape is applied. Don't forget to disinfect your hands and the injection port when administering medicines.

It is a good idea to start planning for aseptic procedures early on when appointments are being scheduled. Clean elective surgical procedures should be carried out in the morning with surgery involving a higher degree of contamination performed during the afternoon. Allocate extra time between patients to ensure that there is sufficient opportunity for staff to prepare the clinical facilities for new patients and to clean the operating theatre and surgical equipment. If there are several patients on the surgical list, you should see clean cases first, followed by dirty cases. For example, if they are seen in the same clinic room, you should always carry out splint replacement before undertaking wound care. Similarly, healthy patients scheduled for elective neutering should be seen before patients attending for dental care or ear flushing.

If animals are fed during their admission, please ensure that high-quality feed is provided and that all feed is handled hygienically. Do not store or handle high risk food items, such as raw meat, at your premises unless it is deemed necessary for the health and wellbeing of an individual patient. (Appendix 1).

2.4.1 Management of blood and body fluid spillages

Body fluids is a term used to describe all organic matter produced by patients and includes urine, faeces, saliva, vomit, purulent discharge, sputum and nasal discharge. Blood and body fluids may contain a high concentration of bacteria and other potential pathogens, and it is important that all spillages are dealt with immediately. Cleaning and disinfecting blood and body fluid spillages forms part of patient care and all staff are responsible for dealing with them. Equipment needed to clean blood and body fluid spillages and to disinfect the affected areas should be easy to access. You could use a basket, including a shopping basket or bucket to hold all the equipment and detergents required for this task. Please make sure that the container used for this purpose can be washed. It is a good idea to keep a number of these cleaning kits handy at your premises. This means that staff are not required to look for them when a spillage has occurred. You should also have a kit available in your waiting area(s), complete with a laminated instruction sheet, to allow owners to clean up after their animals.

The kit should consist of

- Disposable gloves, ideally in size L to make them suitable for most hands
- Absorbent paper towels
- Ready to use disinfectant detergent
- Bin liners
- Bottle of alcohol-based hand rub
- Instructions for cleaning

To disinfect blood and body fluid spillages, use an oxidising or chlorine-based disinfectant (1000 ppm). To remove blood and body fluid spillages, use the two-stage procedure set out below:

1. Make sure you have the appropriate kit or necessary equipment to hand and open up the bin liner
2. Disinfect your hands
3. Put on a pair of protective gloves
4. Place absorbent paper towels over the stain
5. Place the paper and your gloves in the bin liner
6. Disinfect your hands
7. Put on a pair of protective gloves
8. Apply disinfectant to the spillage, leave for a moment and wipe dry
9. Place the paper and your protective gloves in the bin
10. Disinfect your hands

2.5 Monitoring compliance

It is important to monitor hand hygiene compliance in terms of healthcare associated infection rates but also to ensure occupational health and safety and high-quality care delivery. Ensuring that alcohol-based hand rub and personal protective equipment is readily available where it is needed is key to maintaining good hygiene practices within the veterinary setting. Hand disinfectant consumption per patient is an excellent indicator of hand hygiene performance. For example, when administering a vaccine, hand disinfectant should be used 10–15 times, i.e. once for every stage of the procedure. Approximately 3–5 ml of disinfectant should be used each time, meaning that some 50 ml of hand disinfectant should be consumed for each vaccination appointment. When patients are admitted for a number of days, several litres of hand disinfectant should be consumed during their stay.

Direct observation can also be used to assess hand disinfectant consumption. The person assessing compliance should observe a member of staff working at a single workstation for a set period of time. This could be 60 minutes, for example. During that time, they will record every hand hygiene related event, including instances of non-compliance. This type of direct observation can be used to give feedback to individual members of staff and also to provide guidance to larger teams on how to improve compliance. Through observation, you can also identify how many times hand disinfectant should be applied at each workstation in the course of normal clinical activity. This will confirm the optimal number of dispensing episodes and allow you to record actual dispensing episodes. Any discrepancy will be reported as a protocol deviation.

Good hand hygiene can be achieved when all staff are committed and motivated to follow the protocols in place. It is a good idea to establish arrangements for monitor disinfectant consumption and to set up a system for infection surveillance. When it comes to hygienic practice, it is vital that line managers and senior managers are able to support and motivate staff to achieve high levels of IPC compliance and provide clear leadership on occupational health and safety. A named veterinarian and veterinary nurse should be appointed to carry out daily monitoring.

3 Clinical facilities

Veterinary clinics and hospitals, including all facilities, furniture, surfaces, equipment and devices, are clinical environments. Healthy animals, such as staff pets, should not be brought into this environment unnecessarily. Hygienic practice should be observed throughout the hospital environment. This means limiting handling as much as possible, including avoiding all unnecessary petting and other contact, frequent use of alcohol-based hand rub, wearing protective gloves and other personal protective equipment if treating a high-risk patient or it is likely blood or other body fluids will be present. Effective hand hygiene is key to hygienic practice. Additional time should be allocated between patients to ensure that all consultation rooms, operating areas, equipment and devices can be cleaned.

The way veterinary facilities are used to deliver patient care activities matters in terms of risk management and infection prevention and control. There are many types of veterinary clinics, ranging from single-room practices to large hospitals. Regardless of size, it is important that the facilities and equipment are easy to clean. All surface materials must be wipeable with detergent or disinfectant using a damp cloth. Porous materials and textiles that cannot be washed with water are not suitable for veterinary practices. Unsuitable materials include wallpaper, untreated wood and fabric-upholstered furniture. Although curtains and pictures can add a touch of colour to the premises, significant extra work is required to keep them clean and they attract dirt and dust.

As patients attending veterinary premises tend to walk and lie on the floors, come into contact with walls, table and chair legs and any other objects within reach, it is important that floors are not used to store any unnecessary items, including cardboard boxes. It should be possible for all floor surfaces to be fully washable and all table and chair legs and other similar items must also be easy to clean.

Every effort should be made to store equipment and supplies in wall-mounted cabinets. Cabinets with glass doors are ideal, as they allow staff to see their contents without having to open the door. Medical supplies like syringes, cannulas and needles are convenient to store in wall-mounted drawers. Forms, small books and other paper and stationery items

can be stored in filing trays that can be picked up and moved, making cleaning easier. Electrical cables should be managed carefully so that they do not present a trip hazard. Any electrical cables lying on the floor should be wiped clean using detergent before being hung out of the way.

Hand hygiene is an important aspect of all areas of veterinary practice, even when equipment is neatly stored in drawers and behind glass doors. It remains important to ensure that everyone touching door and drawer handles has clean, disinfected hands.

Veterinary surgeries with more than one consultation room may wish to consider re-allocating the rooms according to infection risk. Under this approach, low risk patients on the green pathway, medium risk patients on the yellow pathway and high-risk patients on the red pathway requiring isolation are allocated their own dedicated consultation room (or several, if available).

The rooms can be colour coded to make it easy for staff to identify which patients they should be used for. In practice, this mitigation based approach means that if a patient with an infected wound and a patient with diarrhoea are due to be seen at clinic, in terms of hygiene, it makes sense to treat both patients in the same room and for an unvaccinated young animal to treated elsewhere. Even if the room is cleaned after the high-risk patient has departed, it is possible that some pathogens will remain within the environment, at least for a brief time. In aseptic terms it makes sense to work from clean to contaminated and for low risk patients to be treated in their own dedicated area.

It is also a good idea to categorise clinical facilities based on the type of activities they are used for. For example, dental care and ear flushing should not be performed in an operating theatre or a clinic room that is used for preop preparation. If your surgery only has one consultation room, you should design your clinic template in such a way that all surgical procedures are carried out first, followed by dental care. At the end of the day, the room should be thoroughly cleaned, starting at the top and working downwards.

3.1 Clinical environment

Careful consideration should be given to how the clinical environment is set up. Do not store any unnecessary items in clinic rooms, including boxes or items that are not being used. All supplies should be stored in cabinets and drawers, not displayed on the sides. This prevents medical supplies and devices from becoming contaminated by the patient's blood or body fluids. All desks and other surfaces should be kept as clear as possible to enable effective cleaning. The same applies to floor surfaces, which must be fully washable.

Owners should be encouraged to keep their animals on a leash or inside their transport container while waiting to be seen and once inside the clinic room. This restricts the animals' range of movement and helps to minimise contamination and contact with other patients. Tables or shelves should be provided so cat carriers can be placed off the floor. This is also important for the animals' mental wellbeing. If owners take an active role in care activities, they should be instructed to follow correct hygiene procedures.

It is worth ensuring that your premises are maintained in a clean and tidy condition at all times. This reflects a commitment to high quality care provision and has been shown to promote hygienic working practices.

3.2 Isolation facilities

Dedicated facilities will need to be provided for patients requiring contact isolation. It is a good idea to give careful thought to the layout of your premises to minimise isolation patient contact with non-isolation areas. Ideally, the isolation ward should have its own entrance, or the entrance should be located close to the surgery main entrance. In larger practices with in-patient facilities, thought should be given to patient safety and ensuring ergonomic working conditions for staff. Isolation facilities should not be located at an excessive distance from other working areas, including those used by staff during the evening and night shifts. They must also have hand washing facilities. The area must be easy to clean and simply furnished and floors should be kept clear of obstruction to allow for thorough cleaning.

The area should have basic medical equipment including a stethoscope, thermometer and blood collection supplies available. Additional supplies can be provided to meet the needs of individual patients. These should be placed in a plastic basket or container and placed on a desk outside the isolation area. As a rule, no standard medical supplies that have been brought into the isolation area should be returned to storage. To prevent unnecessary medical supplies from accumulating in the area, careful consideration should be given to what items will needed for patient care and any clean and unused items should be kept outside the isolation area. An easy to clean lidded plastic container should be provided for storing medical supplies required for each individual patient. When the patient is discharged, the items should be cleaned in the isolation area or taken to the sterilisation and decontamination unit before being returned to the premises.

The isolation facility would ideally have its own entrance and a dedicated outdoor area for patient use. It is useful note that the risk of transmission is relatively low if wounds are dressed and patients with diarrhoea or urinary incontinence wear an incontinence pad or

nappy. A cleaning trolley containing a clean mop and detergent and disinfectant suitable cleaning blood and body fluid spills (chlorine 1000 ppm) should be provided and used to clean the corridor after the patient has used it. Sedation allows for easier moving, handling and transport, including for imaging purposes, but it is contraindicated for the purpose of taking the animal outside e.g. for exercise or toileting. When isolation patients are taken outdoors, the above steps must be followed, and the animal must kept on a leash for the duration of the outing. It is important to ensure that it is not allowed to sniff other patients or the premises en route.

Ideally, a separate outdoor area should be provided for isolation patients, with a surface that can be replaced from time to time. Choosing the ideal surface can be challenging. Concrete, although easy to clean, is unlikely to prove popular with dogs. Dogs that are unwell and find themselves in an unfamiliar setting may not go to the toilet on concrete. Loose faeces are impossible to clean off grass or gravel. Sand makes the task easier but will be carried indoors on the animals' paws, lessening its appeal. A well-designed outdoor area offers excellent drainage. Woodchip may be a good alternative as it allows rain and urine to pass through and makes clearing up faeces easier. Woodchip is also relatively easy and cheap to replace. Adding slaked lime alters the pH of the outdoor surfaces, creating an environment that is unconducive to pathogens.

If it is not possible to provide facilities that are exclusively used for isolation purposes, it is a good idea to always house isolation patients in the same room and ensure that it is fitted, equipped and cleaned in such a way as to prevent the risk of transmission for other patients using the same facility.

It is necessary to have a systematic cleaning schedule in place and all equipment must be maintained carefully and cleaned between patients. If more than one patient carrying the same so-called problematic microbe (e.g. MRSP) is scheduled to be admitted in the course of one day, it will not be necessary to disinfect the premises, as the patients do not represent a risk to one another. However, if on the same day patients are admitted for isolation for other reasons, the facility will need to be disinfected to protect them against infection.

Providing a dedicated area for patients requiring contact isolation is a sensible course of action, as it allows disinfection to always be carried out in the same area and as the room does not contain any unnecessary furniture or equipment, cleaning it takes less time. Medical supplies and equipment that are regularly used in the isolation room can be stored in a cabinet inside the room or in a lidded container or drawer. If these items are stored in the room itself, it is vitally important that only clean equipment is returned to the cabinet or container. The purpose of isolation is to reduce indirect contact with other patients by providing isolation patients with their own facilities as well as dedicated equipment and PPE.

3.2.1 Protective isolation and double isolation

Protective isolation is used to protect highly susceptible patients from healthcare associated infections (HAIs). This includes patients who may be severely neutropaenic due to chemotherapy treatment. Unvaccinated young animals that require admission in an in-patient or critical care unit and share facilities with several other patients are often placed in protective isolation.

The parvovirus and feline panleukopenia virus often affect young or unvaccinated animals with underdeveloped immune systems and sufferers are often susceptible to secondary infections and HAIs.

These patients are placed in so-called double isolation and enhanced precautions should be implemented in their care provision. They will need to be isolated from other patients due to the risk they pose to others and vice versa. Staff carrying out patient care activities should wear PPE, including protective gloves and footwear. The animals may suffer from significant diarrhoea and vomiting, and it is recommended staff wear face masks and surgical caps due to the risk of splashing and spraying involved.

4 Veterinary patient risk assessment

SUMMARY

Low-risk patients

- Basic protection measures
- Observe standard precautions, including effective hand hygiene and aseptic technique

Moderate risk patients

- Observe standard precautions and apply enhanced protection measures, i.e. effective hand hygiene, choice of PPE, choice of clinical environment and cleaning

High risk patients

- Standard precautions and enhanced protection measures
- Patient placed in isolation, segregated from other patients
- Enhanced hand hygiene, PPEs to be worn for all direct patient care activities
- Use medical equipment exclusively allocated to this area
- Restricted access to non-isolation areas
- Isolation facility and medical equipment to be disinfected

The majority of patients attending a veterinary surgery will present with no risk factors and display no signs of infectious disease. However, many patients will have a series of risk factors in terms of multidrug resistant bacteria and infectious disease. Highly problematic microbes like multidrug resistant bacteria and *Salmonella* are easily transmitted between patients, can be passed on to people caring for patients, survive for long periods on inanimate surfaces, be spread by staff and medical equipment and are capable of causing infections that are difficult to treat.

In all patient care delivery, every effort must be made to preventatively minimise the risk of infection by paying particular attention to hand hygiene and choice of PPE, planning clinical activities in advance and ensuring all medical supplies and equipment required are to hand, taking regular microbiological samples and carefully managing the patient's access to the premises. Risk is assessed on a sliding scale. In practice this means that gown and gloves should always be worn for patients with diarrhoea, regardless of whether they are suspected to have an infectious disease, while gloves are sufficient for ESBL carriers attending for vaccination provided that they are clinically well.

4.1 Low risk patients (Green)

Patients will be categorised as low risk if they do not present with the risk factors set out in Tables 1 and 2 with regard to colonisation by problematic multidrug resistant organisms or other pathogens. For example, a puppy born in Finland that is fed commercially produced dog food and is clinically well and attending the surgery for a vaccination appointment would be categorised as a low-risk patient. Standard hygiene precautions should be taken when dealing with low risk patients.

4.2 Moderate risk patients (Yellow)

Patients will be categorised as moderate risk if there is an increased risk that they may carry problematic multidrug resistant microbes or other infectious diseases. An individual animal may screen positive for one or more risk factors (Table 1). It is important to recognise that these patients represent an elevated risk. Enhanced protection should be observed by staff and effective hand hygiene performed. Careful consideration should be given to where the patient is seen, and the area should be thoroughly cleaned when the consultation is finished.

In general, all patients presenting with diarrhoea, vomiting, coughing, UTI-induced urinary incontinence or infected or discharging wounds are categorised as so-called yellow patients. They release high numbers of micro-organisms into the environment, representing a transmission risk for other patients.

Table 1. Risk factors indicating enhanced precautions

Risk factor	Potential problematic pathogen	Precautions	Screening for multidrug-resistant bacteria
≥ 3 courses of antimicrobials in past year	MRSP/A, ESBL	Gloves for mucosal contact	Recommended
Recurring skin or ear infections	MRSP/A	Gloves for direct patient care, gown as required	Recommended
Recurring UTIs	ESBL, (MRSP)	Gloves for direct patient care, gown or apron if incontinent	Recommended
HAI, including surgical site infection	MRSP, ESBL, MRSA	Gloves for direct patient care, gown as required	Recommended Primary infectious focus sample
Animal imported ≤ 3 months previously	ESBL, MRSP, Rabies	Gloves for mucosal contact	Recommended
Raw food diet	ESBL, *Salmonella, Yersinia*, Campylobacter, Enterotoxigenic Escherichia coli	Gloves for mucosal contact. Gown or apron for patients with diarrhoea, consider isolation.	Screen for ESBL and faecal sample if patient has diarrhoea
Pyrexia and respiratory signs, especially in juvenile dogs	*Bordetella bronchiseptica*, viral infections	Gloves for mucosal contact. Gown if patient coughing or sneezing.	Not recommended

4.2.1 Aerosol generating procedures

Even if the patient does not present with any infectious disease risk factors, it is important to ensure the occupational health and safety of staff undertaking medical procedures involving aerosols or droplets, such as dental and wound care and ear flushing. Staff performing these types of procedures must wear gloves, a gown and splash-resistant apron as well as a surgical mask and cap. Safety goggles or a visor are also recommended to protect the eyes from splashes. It is a good idea to prepare the area where the procedure is carried out in advance to make postoperative cleaning easier. In practical terms this means removing any unnecessary items, supplies and equipment and placing them at a safe distance or >1 metre away.

4.3 High risk patients (Red)

Patients will be categorised as high risk (isolation) if they are known or strongly suspected to be carrying a multidrug-resistant problematic microbe or infectious disease, whether they are symptomatic or not (Table 2). Enhanced precautions should be applied, and the patient should be treated in an isolation facility.

Table 2. Risk factors indicating the need for enhanced precautions (Red patients)

Risk factor	Suspected cause
Diarrhoea with pyrexia, diarrhoea may be bloody	Salmonella
Pyrexia, muscle stiffness, urinary symptoms	Leptospirosis
An animal living with another animal or human that has been confirmed as a carrier	MRSA, MRSP, ESBL; close contact or other depending on findings
An animal imported < 3 months ago from abroad with clinical infection	Multidrug resistant bacteria

4.3.1 Precautions

Enhanced protection involves careful hand hygiene and hand disinfection, PPE should always be worn for patient care and the patient should be placed in isolation. Always wear gloves, gown and footwear exclusively used in the isolation facility for every episode of direct contact care. Surgical masks and caps should be worn when required.

4.3.2 Providing high quality care for patients in isolation

Patients placed in isolation must receive the same standard of care as patients not in isolation. It is also important to consider the needs of the patient's owner. Staff should provide them with all relevant information and ensure that they have understood it. Owners should also be given advice on infection prevention and its importance. Every effort should be made to ensure that the experience is not stigmatising for the owner and that they do not feel uncomfortable around other clients attending the surgery. To avoid drawing unnecessary attention to the owner, it is not necessary for staff to wear PPE when admitting the patient. PPE can be put on once the patient and owner have entered the consultation room. In addition to standard medical advice, the owner should be given further written information regarding the reason their pet has been placed in isolation and that will provide answers to the most frequently asked questions.

4.4 Planning medical procedures for patients in isolation

For patients in isolation, every effort should be made to ensure that all care is provided at the isolation facility. Many investigations, including ultrasound imaging, can be carried out at the patient's bedside, provided that the devices are portable, and the isolation facility is large enough to accommodate them. However, if necessary, patients can be moved out of the isolation facility for treatment, provided that careful consideration has been given

in advance to how the patient will be transported, how the treatment room is set up and how the facilities and any equipment will be cleaned and disinfected. This calls for good communication and teamwork between staff.

4.4.1 Surgery for patients in isolation

Being a carrier of a multidrug resistant organism or other pathogen is not a barrier to surgery. The difference is that in addition to standard precautions, "dirty cases" should be scheduled at the end of the theatre list, staff are required to wear PPE for the entire duration of the procedure and the operating theatre should be set up with the particular needs of the isolation patient in mind.

4.4.2 Pre-operative preparation – the operating theatre

Before the operation, the operating theatre should be cleared so that only the medical devices, equipment and items of furniture required in the operation remain. Staff should make any supplies that may be needed in the course of the procedure outside of the operating theatre so that they are close at hand and easily available. It is a good idea to protect the front and contact surfaces of any medical devices using clear plastic as not all devices are suitable for wiping with a disinfectant. They must not be fully covered to prevent overheating and due to fire safety reasons. After the operation, the plastic should be rolled up, so the contaminated side remains on the inside. If the employees working at the practice are permanent and highly experienced, and it is certain that all surfaces will be thoroughly cleaned after surgery on the isolation patient has been completed, the plastic sheeting may not be necessary.

During surgery on patients in isolation, every effort should be made to avoid opening cabinets and drawers and all suturing materials and other supplies should be set up in advance, either inside the operating theatre or just outside it. An isolation sign should be placed on the door to ensure that all staff are aware of the patient's status. It is a good idea to place a towel dipped in disinfectant on the operating theatre door to allow people to clean their shoes as they pass. It is also recommended to have a circulating member of staff in attendance, as they can collect any missing instruments or devices, organise blood testing or source medicines to prevent the operating staff from having to leave the theatre.

4.4.3 Pre-operative preparation – the patient

Pre-operative preparations should always be carried out in isolation from other patients. The preparation can be done in the isolation facility and the patient transferred to the operating theatre once it has been anaesthetised. Alternatively, the pre-operative

preparation can be carried out in the operating theatre itself. In the latter case, preoperative sedation is recommended and most of the hair removal should be carried out before the patient leaves isolation. Staff carrying out preoperative preparations should wear a gown, gloves and surgical cap. Additionally, a surgical mask should be worn during hair removal and while cleaning the surgical site. If the preoperative preparation activities are carried out in the operating theatre itself, all staff in attendance should wear a surgical mask and cap.

4.4.4 PPE and asepsis

Staff carrying out surgical procedures should wear sterile laminated gowns, sterile gloves and surgical masks and caps in accordance with standard procedure. For patients in isolation, protective eyewear should be added. Other surgical team members should wear non-sterile gowns, gloves, surgical masks and caps. It is recommended that they also wear eye protection for aerosol generating procedures, abdominal surgery and surgery involving high volumes of blood and body fluids or lavage. All staff should also wear machine washable protective footwear that are exclusively used for surgery in isolation patients. As non-operating staff are required to change gloves frequently, a box of gloves and a bottle of hand rub should be placed close to the patient for ease of use.

It is essential that all staff working in the operating theatre are aware of the clean and dirty areas. Clean areas must not be contaminated by touching them with gloved hands. They should only be touched with disinfected bare hands. Clean areas include all cabinets and drawers. It's also a good idea to have a surgical trolley to hand that can be used for anaesthetic monitoring charts, pens and medicines. The operating table and any medical devices adjacent to it are generally considered "dirty", including the anaesthetic machine, infusion pumps and suction unit.

The anaesthetic monitoring chart and pen will become contaminated during surgery. When the operation has been completed, the pen should be disposed of and the anaesthetic monitoring chart placed in a clear plastic wallet, scanned into the patient record or filed inside the wallet. Alternatively, it is possible to take a photograph of the chart, which can then be appended to the patient's medical record and the contaminated form no longer needs to be retained.

If any staff exit the operating theatre while surgery is ongoing, they should remove their gown and gloves, disinfect their hands and change into their regular work shoes. When they return, fresh PPE should be put on. When the operation is finished, all operating theatre staff should disinfect their hands and change into clean uniforms.

4.4.5 Cleaning and disinfection – high risk patients

When they are no longer required, all textiles used for patients in isolation should be disposed of or placed in laundry bag that's clearly marked so that staff handling the items will be aware that it may be contaminated. It is a good idea to set aside old blankets and other bedding items for use with patients in isolation as these can be disposed of after use.

Alternatively, a water-soluble laundry bag for contaminated textiles can be used to minimise handling by staff. However, if the contaminated items need to be removed from the laundry bag and placed in a washing machine by hand, a gown, gloves and surgical mask must be worn. Contaminated laundry from isolation facilities must be washed at a minimum of 60 °C using a normal wash cycle. It is a good idea to use a laundry disinfectant alongside regular laundry detergent to ensure a hygienic result.

All items, including medical supplies and devices, used in the care of patients placed in isolation should be cleaned after use with a disposable or microfibre cloth soaked in disinfectant detergent. Instruments should be soaked in disinfectant prior to washing to minimise the risk of contamination from splashing. All rubbish generated during the period of isolation can be placed in non-infectious waste. All blood, body fluids and visible soiling should be cleaned using detergent in accordance with the blood and body fluid disinfection protocol. All tabletops and other surfaces as well as floors should be cleaned using a disinfectant.

4.4.6 Equipment maintenance and operating theatre cleaning following surgery on patients in isolation

Following surgery on a patient cared for in isolation, it is essential that that the operating theatre is cleaned before the next operation. PPE should be worn during cleaning. All blood and body fluids and spills should be cleared first using a disinfectant suitable for the purpose. This will be followed by the entire operating theatre, including operating table, operating light, all surgical devices and equipment and surfaces, which will be cleaned with regular detergent and then a disinfectant.

All anaesthetic devices and equipment will need to be thoroughly cleaned using a disinfectant detergent. Disinfection is carried out using aseptic technique, working from clean areas to dirty areas and from top to bottom. This means that you should start with operating lights, the operating table and cabinets and then moving on to floors. Particular care should be taken with fomite surfaces, including drawer, cabinet and door handles, taps, operating light handles and monitor buttons. All surgical instruments and machine washable medical equipment should be sent to the relevant service for cleaning in lidded container clearly labelled to make staff aware the contents have been used in surgery involving a patient in isolation.

5 Daily decontamination – clinical facilities and equipment

The decontamination of consultation and treatment facilities is an essential part of good hygiene practice. Protective gloves should always be worn during cleaning to reduce exposure to chemicals. Following a consultation with a low risk patient, the examination table and consultation room should be cleaned with a mild alkaline all-purpose detergent and a high-quality microfibre cloth. Separate equipment should be used on tables and floors. If blood or body fluids are present, a suitable disinfectant should be used. Blood and body fluids should be removed prior to disinfection (please see guidance on managing blood and body fluid spillages).

Safety data sheets need to be provided for chemicals and detergents used at the practice, and these should be easy for staff to access. They can be printed and placed in a folder or uploaded onto the practice intranet. It is the employer's responsibility to ensure that the PPE required for cleaning is readily available for staff. These include::

- Single use protective gloves, nitrile gloves are more chemically resistant than vinyl or latex gloves
- Thicker rubber gloves with long sleeves and cotton gloves to be worn with them,
- Shoe protectors and/or protective footwear or wellies
- Gowns and aprons

In addition to the safety data sheets, directions for use should also be readily available to ensure that locums and other temporary staff access the information they need. Appendix 3 sets out the most common detergents and disinfectants at the time of writing.

5.1 Decontaminating devices, equipment and personal items

5.1.1 Devices and equipment

Electrical devices, including computers, keyboards and mice should be cleaned daily. Devices used for one patient at a time, including ultrasound machines, infusion pumps, anaesthesia machines, ventilators, monitors and patient warming systems should be cleaned between patients. Most devices can be cleaned using an alcohol-based detergent but please check manufacturer's instructions for each device. Any collars, harnesses and muzzles should be machine washed at 60 °C using a disinfectant like Erisan Oxy+. Cat litter trays and animal food bowls should be cleaned and disinfected after use. Litter trays should never be handwashed in the same area used for washing up food bowls. After mechanical decontamination, they can be disinfected by soaking them in a large container filled with a disinfectant like peroxygen. Please refer to the directions for use for the correct duration of soaking.

We recommend that all larger veterinary practices purchase a washer-disinfector. This will make the decontamination process quicker, easier, safer and more hygienic. Emptied litter trays, for example, can be placed in the washer-disinfector without prewashing. Always follow the manufacturer's instructions.

5.1.2 Personal items

Staff personal items like mobile phones, pens, pencil cases and keys should be decontaminated daily using a detergent disinfectant. Stethoscopes should be cleaned between each patient. Stethoscopes are personal objects and should never be leant to anyone else. If separate stethoscopes are provided, in an isolation facility for example, they must be cleaned after every episode of use, including earpieces.

Staff should never wear clothes in the workplace that they use outside of work. Your work attire should comprise a formal uniform or your own clothing that is exclusively used for clinical work only. To ensure proper hygiene, it is a good idea to wear a uniform that is washed on site or sent off to a laundry service to avoid work clothing being taken home for washing. Uniforms should consist of full-length trousers and a short-sleeved top. Staff who opt to wear traditional white clothes should ensure that the sleeves are elbow length or can be wrapped to ensure that they are bare below the elbows for all direct patient care activities. Wide sleeves are easily soiled and are a barrier to effective hand hygiene. Wide hems are liable to come into contact with patients or floors when kneeling and performing examinations. Staff preferring to wear a white coat should take it off while examining patients and carrying out medical procedures and will need to disinfect their hands before taking it off and putting it on again.

5.1.3 Managing waste and laundry

Laundry facilities should be divided into clean and dirty areas to ensure that laundry remains separate and clean laundry does not become contaminated by dirty laundry. Laundry items typically comprise bedding, leashes, harnesses and any staff uniforms that are washed on site. Dirty laundry is heavily contaminated with microorganisms and care should be taken when handling it. Gloves should always be worn and hands must be disinfected when the task is completed. It is advisable to place a container (a fabric laundry bag) for dirty laundry in each consultation room. Dirty laundry should be placed in these bags immediately after use. Dirty laundry is then transported into the laundry room inside the bags and placed directly into a washing machine. The bags should be handled with care and not shaken or to prevent the microorganisms from becoming airborne and contaminating clean laundry stored in the same area. Once the dirty laundry has been placed in the machine, wipe the opening and door or lid using a detergent to avoid contaminating the clean washing when it is taken out of the machine. Hands should be disinfected before handling clean washing.

All washing generated at the practice should be washed at 60 °C or at the highest temperature the items can withstand. Please note that in some domestic washing machines, the temperature may not reach 60 °C during the cycle or remain at 60 °C for a sufficient amount of time to allow the contamination to be eliminated. As such, it is a good idea to wash all items contaminated with blood and body fluids at a higher temperature or add a disinfectant to the cycle. These can also be used at lower temperatures. Please refer to the instructions for correct dosage.

Waste should be sorted and managed in line with local waste management guidelines. Please ensure that sufficient numbers of waste bins are available throughout the practice and that they are emptied regularly. A protocol for this should be recorded in the practice annual cleaning policy.

5.2 Daily cleaning

The main focus of all cleaning activities should be on areas that are key for care delivery. These include all surfaces, including door, cabinet and kennel handles, treatment tables and other surfaces and taps and sinks. As microbes are spread through staff hands, these surfaces should be prioritised for cleaning and floor surfaces should be cleaned after them. Hand hygiene and hand disinfection are key to preventing the spread of infection. Walls and ceilings should be cleaned annually and in response to any blood or body fluid spills.

The facilities should be divided into zones, which determines how frequently they are cleaned and itemizes the cleaning methods that are to be used (Table 3). All veterinary practices must have a cleaning handbook or cleaning protocol in place that allows the necessary routines to be carried out even if permanent staff are not available. It may be a good idea to have a sign displayed in each consultation room which confirms the zone the facility is in, how often it should be cleaned and which methods should be used. Checklists can also be provided, which should be signed by the person who has carried out the cleaning. Laminated signs indicating that cleaning is required and that cleaning has been carried out can be placed on the door or door frame. This allows staff to ensure that the facilities are cleaned regularly using the appropriate cleaning methods, even when cleaning is outsourced to an external provider or when cleaning is carried out outside of practice opening hours. How often the facilities are cleaned will vary. Cleaning can be carried out between each patient (operating theatres and isolation facilities), weekly (offices and administrative areas), monthly (kennel facilities) or annually or bi-annually (tops of units, ventilation units). It is a good idea to have an annual cleaning plan in place that covers the entire facility.

All equipment used for cleaning must in good working order and suitable for use for all tasks required. It is also important to ensure that they are permanently in stock and readily available. Ergonomics matter and appliances and machines should be used to support the cleaning process when possible, particularly in larger practices. Professional machinery makes cleaning more efficient and effective, reduces strain and deliver more consistent results. Always use high-quality microfibre cloths as they effectively gather dirt and bacteria and they lend themselves to many uses, often without detergent being needed. They can be used dry to pick up dust and loose hairs or damp to effectively eliminate dirt and bacteria. Microfibre cloths can be used on all surfaces, including floors.

Microfibre cloths are strong and durable and their performance is improved with machine washing. A high-quality will maintain its effectiveness for up to 300–500 washes. When it comes to purchasing cleaning equipment and cloths, it is worth investing in quality as they will ultimately pay for themselves through a lower per-use cost and better results. It is essential that all cleaning equipment is maintained in a clean and hygienic manner to ensure that they do not contaminate the areas they are used to clean. All equipment should be cleaned after use. Mops and cleaning cloths should be machine washed at high temperatures of 85–90°C. Once washed, cloths can be placed directly in the cleaning trolley or dried in the tumble dryer. Always wipe mop and brush handles when the cleaning is complete. Cleaning equipment should be stored in cleaning trolley, as this will make the cleaning process easier and more convenient. The equipment should be stored in their own dedicated area.

Table 3. Sanitary zones and cleaning methods

Sanitary zone	Tasks	Methods Routine cleaning (using standard detergent) Disinfection cleaning (using disinfectant) Disinfecting blood and body fluids Sanitisation
Sanitary zone A		
Operating theatres	Cleaned after each patient (wipe clean all surfaces, including operating table and operating lights, empty bins, remove blood and body fluids, wipe down floors with damp cloth/mop)	Routine Disinfection after isolation use Disinfection for blood and body fluid spills
Preoperative preparation	Wipe down surfaces between patients Remove blood and body fluids Empty bins and clean floors daily	Routine Disinfection after isolation use Disinfection for blood and body fluid spills
Recovery ICU	Wipe down surfaces, empty bins, remove blood and body fluids and clean floors daily Following discharge, use damp brush, microfibre cloth or mop to wipe down kennel Disinfection to be carried out every 2–4 weeks	Routine Disinfection after isolation use Disinfection for blood and body fluid spills
Sanitary zone B		
Equipment maintenance Laboratory Any areas where medicines are handled	Wipe down surfaces, empty bins, remove blood and body fluids and damp clean floor daily.	Routine Disinfection after isolation use Disinfection for blood and body fluid spills
Sanitary zone C		
X ray Procedure/treatment room Kennel rooms Waiting areas	Wipe down examination table after each patient Wipe down surfaces, empty bins, remove blood and body fluids and damp clean floors daily. Following discharge, use damp brush, microfibre cloth or mop to wipe down kennel	Routine Disinfection after isolation use Disinfection for blood and body fluid spills
Sanitary zone D		
Isolation room/treatment room for high-risk patients/	Daily when in use Clean between patients, as appropriate (if different indications for isolation, e.g. MRSP/ESBL) Daily when in use	Disinfection
Staff and visitor facilities Back office facilities Administrative Staff mess Sanitation facilities	Clean surfaces daily Weekly Weekly Weekly Daily	 Routine Routine Routine Sanitisation

Always observe aseptic practice in all cleaning activities. The workflow should be from clean to dirty (Table 4). Disposable gloves must be worn and the same hand washing procedures that apply to direct patient care activities must be followed, i.e. hands must be disinfected before and after gloves are worn and care should be taken not to contaminate clean surfaces when gloved. Gloves are a vital part of occupational health and safety when working with detergents and other chemicals. Staff responsible for cleaning isolation facilities should wear PPE like a gown or apron and gloves. If it is likely that splashing or spraying will be involved during the cleaning process, surgical masks and caps should be worn too. If separate protective footwear is available for this area, it should also be worn during cleaning.

Table 4. Sample veterinary practice cleaning plan

1. Patient facilities	2. Staff/visitor areas
1. Operating theatre 2. Preoperative preparation areas 3. Recovery room 4. Equipment and instrument maintenance/laboratory facilities 5. Other patient facilities (incl. examination rooms) 6. Facilities for dirty/contaminated procedures/colonic cleaning 7. Isolation facilities	1. Staff canteen 2. Reception desk in waiting area 3. Waiting area (other areas) 4. Sanitation facilities (all)

5.2.1 Routine cleaning

Routine cleaning must be carried out daily in the care environment. All surfaces should be wiped with a damp high-quality microfibre cloth with or without detergent. If all blood and body fluid spills are removed immediately and routine cleaning is carried out daily, there will be no build-up of dirt on the premises. As detergents are not required to tackle dirt and grease, there is no chemical build up. High-quality microfibre cloths are made of very fine textile fibres and threads may be split to enhance their quality. Decitex (dtex) is the unit of measurement used to describe textile fibres. For microfibre cloths the dtex value should ideally be between 0.1 and 0.5. Split fibre cloths offer more effective results because they have a greater surface area and a higher positive charge.

5.2.2 Disinfection

Disinfection cleaning must be carried out following the discharge of all high-risk patients, patients that have been looked after in isolation and patients that are suspected of carrying a transmissible micro-organism. All blood and body fluid spills must be cleaned immediately in accordance with the relevant protocol. The area should either be cleaned with a disinfectant detergent or first cleaned with a microfibre cloth with or without using detergent, followed by a disinfection of all surfaces. It is important that all surfaces are thoroughly cleaned prior to a disinfectant being used. This is because disinfectants cannot penetrate organic waste. Alcohol, for example, binds organic waste to surfaces, making it even harder to remove. If surfactant disinfectants are used, two-stage cleaning is not required.

It is a good idea to discuss your cleaning methods and the cleaning agents used with the detergent and cleaning equipment suppliers directly, as they are often able to offer information and support.

6 Conclusions

Veterinary practices come in many sizes both in terms of their facilities and their staff, and the number and range of animals they see can vary widely too. This guide is designed to cover all the most important measures for hygienic practice. There are four key areas of practice that apply to all veterinary surgeries; effective hand hygiene, aseptic practice, general tidiness and routine daily cleaning. They are essential to responsible veterinary practice and key to preventing the spread of infectious diseases on the surgery premises.

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Appendix 1. Pathogens, their key infection routes and precautions to be observed

Problematic microbes	Infectiousness	Routes of infection and high-risk tissue/body fluids	Precautions	Additional information
Brucella canis (*)	Low	Contact Uterine secretions, urine, blood, aborted foetuses	Contact precautions**	
ESBL*	Moderate	Contact Faeces, infected urine or wound secretions	Contact precautions	
Giardia (*)	Low	Contact Faeces	Contact precautions Handwashing with soap	
Campylobacteria *	Moderate	Contact Faeces	Contact precautions	If symptoms develop following exposure ⟶ seek medical advice.
Kennel cough (*Bordetella bronchiseptica*) (*)	Moderate	Contact Droplet (and aerosol)	Contact precautions	
Leishmaniasis	Low	Vector	-	
Leptospirosis*	Moderate/ High	Contact Airborne Mucosa, skin, respiratory tract Urine	Contact precautions Surgical mask Surgical cap Protective eyewear	If symptoms develop following exposure ⟶ seek medical advice..
MRSA*	Moderate	Contact Mucosa, skin	Contact precautions	
MRSP	Moderate	Contact Mucosa, skin	Contact precautions	
Canine parvo virus Feline panleukopenia	High if unvaccinated	Contact Faeces, hair/fur	Double isolation Contact precautions Handwashing with soap	
Canine distemper Dogs Ferrets	High if unvaccinated	Contact Droplet (and aerosol) Respiratory secretions, saliva	Contact precautions	
Rabies*	Moderate/ High	Bites Saliva or sputum on non-intact skin	Contact precautions Surgical mask Surgical cap Protective eyewear Do not handle animals if skin on hands not intact	Bites should be rapidly cleaned with plenty of soap and water and disinfected. Seek immediate medical attention. www.thl.fi ⟶ rabies.
Salmonella*	High	Faeces	Contact precautions Surgical mask	If symptoms develop following exposure ⟶ seek medical advice.
Toxoplasmosis (*)	Low	Contact Cat faeces (>1 day old) Faecal stains on fur	Contact precautions Handwashing with soap	
Yersinia (*)	Low	Contact Faeces	Contact precautions	

*Zoonosis, (*) low risk of animal-to-human transmission, **gloves, gown, dedicated protective footwear, separate facilities

Appendix 2: Pathogen survival, recommended disinfectants

Problematic microbes	Survival I = indoors (dry surfaces) O = outdoors	Cleaning agents	Special precautions For zoonoses (see Appendix 1), treat the area with disinfectant, do not commence cleaning until the disinfectant has had time to take effect!
Brucella canis	5 weeks (I) Several months (O)	Common disinfectants***	
ESBL	Several weeks on surfaces (I)	Common disinfectants	
Giardia	Oocysts can survive for several months in cold water 1 week at room temperature (I) 7 weeks at 4 °C (O) Heat and sunlight will kill them in a few days	Common disinfectants	High temperature wash cycle (60–90 °C), tumble dry
Campylobacters	Can survive for long periods on damp surfaces (I, O)	Common disinfectants	Disinfect all blood and body fluids before washing and disinfection High temperature wash cycle (60–90 °C), tumble dry Enhanced cleaning Disinfect outdoor areas with lime (increase pH of outdoor surface)
Kennel cough	Survives for weeks in a warm, damp environment Does not survive on dry surfaces (I)	Common disinfectants	
Leishmaniasis		Regular detergent	Disinfection not indicated
Leptospirosis	> 50 °C sufficient to destroy, survives in below zero temperatures, susceptible to dry conditions. Survives for long periods in stagnant drain water.	Common disinfectants	Pour disinfectant into drain Disinfect all blood and body fluids before cleaning and disinfection
MRSA	Several weeks (I)	Common disinfectants	Disinfect blood and body fluids before cleaning and disinfection
MRSP	Several days (I)	Common disinfectants	
Canine parvo virus Feline panleukopenia	Several months (I) Several months (O)	Recommend peroxygens	
Canine distemper	Several hours (I) Several weeks 0-4 °C (O) Virus killed by dry environments and UV light	Common disinfectants	
Rabies	Virus killed by dry environments and UV light (I, O)	Common disinfectants	Disinfect blood and body fluids before cleaning and disinfection
Salmonella	Survives for long periods on all types of surfaces (I, O)	Common disinfectants	Disinfect blood and body fluids before cleaning and disinfection. Enhanced cleaning Disinfecting outdoor areas with slaked lime (to increase the pH level of the soil surface)
Toxoplasmosis	Cats are primary hosts, excrete oocysts in their faeces. Oocysts become actively infective in 1-5 days, so cleaning the cat's faeces out of the litter box within a few hours will minimise the risk of infection (I) Survives well in outdoor areas, even up to 2 years. However, cannot withstand temperatures below -12°C.	Water and soap, hot water OR 10% ammonia	Wash textiles in hot water (60-90 °C), tumble dry If the surface has been contaminated for less than 1 day (unsporulated oocysts), hot soapy water will be effective. If the oocysts have sporulated, 10% ammonia will be required.
Yersinia	Several days on dry surfaces (I) Days/months (O)	Common disinfectants	

***standard disinfectant detergents= peroxygen-based agents, cleaning chlorine-based agents, quaternary ammonium compounds, cleaning alcohols

Appendix 3. Detergents and disinfectants, various purposes. The table lists some of the detergents most commonly used in Finland and is not designed to be exhaustive.

Decontamination process	Product name	Active ingredient	Class	Precautions
Disinfection	Virkon®S DuPont	Pentapotassium bis(peroxymonosulphate) bis(sulphate) 40–50%	Oxidising agent	Corrosive agent
	Hygisept Kiilto	Potassium persulfate >30%	Oxidising agent	Corrosive agent
	Oxivir Plus Diversey	Accelerated and stabilised hydrogen peroxide 5–15%	Oxidising agent	
	Erisan Oxy+ Kiilto	Hydrogen peroxide Peracetic acid	Oxidising agent	
	Tevan Panox 200 Kiilto	Stabilised hydrogen peroxide 2% Peracetic acid	Oxidising agent	
	Oxivir Excel Diversey	Accelerated and stabilised hydrogen peroxide	Oxidising agent	
	Sactiv nestekloori Diversey	Sodium hypochlorite <5%	Antimicrobial chloride	Cleans and disinfects Added to cool water
	Sactiv Kloramiini Diversey	Chloramine-T 5–15%	Antimicrobial chloride	Cleans and disinfects Added to cool water More user friendly and longer acting than hypochlorite
	Desichlor Kiilto	Chloramine-T	Antimicrobial chloride	Cleans and disinfects Added to cool water More user friendly and longer acting than hypochlorite
	Pluschlor Kiilto	Sodium hypochlorite	Antimicrobial chloride	Cleans and disinfects Added to cool water
	Antibact Kiilto	Didecyldimethylammonium chloride <5%	Quaternary ammonium compound	Cleans and disinfects Not effective against nonenveloped viruses, e.g. Parvovirus
	Suma Bac D10 Diversey	Benzalkonium chloride 7%	Quaternary ammonium compound	Cleans and disinfects Not effective against nonenveloped viruses, e.g. Parvovirus
	EasyDes Kiilto	Ethanol 55-60% Detergents 0,5%	Alcohol	Cleans and disinfects
	Desiol Berner	Ethanol 75% Detergent	Alcohol	Cleans and disinfects
	Heti klooripesu Berner	Sodium hypochlorite 4%	Antimicrobial chloride	Cleans and disinfects Added to cool water

Decontamination process	Product name	Active ingredient	Class	Precautions
	Heti Trio Berner	Chloramine-T 5-15%	Antimicrobial chloride	Cleans and disinfects Added to cool water More user friendly and longer acting than hypochlorite
Blood and body fluid disinfection	Erisan Oxy+ Kiilto	Hydrogen peroxide Peracetic acid	Oxidising agent	
	Tevan Panox 200 Kiilto	Stabilised hydrogen peroxide 2% Peracetic acid	Oxidising agent	
	Hygisept Kiilto	Potassium persulfate >30%	Oxidising agent	
	Virkon®S DuPont	Pentapotassium bis(peroxymonosulphate) bis(sulphate) 40-50%	Oxidising agent	Corrosive substance
	Desichlor Kiilto	Chloramine-T	Antimicrobial chloride	Cleans and disinfects Added to cool water More user friendly and longer acting than hypochlorite
	Pluschlor Kiilto	Sodium hypochlorite	Antimicrobial chloride	Cleans and disinfects Added to cool water
	Sactiv nestekloori Diversey	Sodium hypochlorite <5%	Antimicrobial chloride	Cleans and disinfects Added to cool water
	Sactiv Kloramiini Diversey	Chloramine-T 5–15%	Antimicrobial chloride	Cleans and disinfects Added to cool water More user friendly and longer acting than hypochlorite
Device surface disinfection	Bacticid wipes Chemi-Pharma	Ethanol 50–75% Propanol 2.5–10%	Alcohol	No decontaminant effect, only suitable for surfaces that appear clean
	Oxivir Excel Wipe Diversey	Accelerated and stabilised hydrogen peroxide	Oxidising agent	pH 1.9 ⟶ Protective gloves must be worn
	EasyDes Kiilto	Ethanol 55–60% Detergent 0.5%	Alcohol	Cleans and disinfects
	Suma® Alcohol Wipes Diversey	Propanol	Alcohol	No decontaminant effect, only suitable for surfaces that appear clean
	Desiol Berner	Ethanol 75% Detergent	Alcohol	Cleans and disinfects
All-purpose detergents (mildly alkaline)	Vieno Kiilto	Anionic surfactants and soap	Surfactant	Cleans, removes dirt
	Jontec 300 free Diversey	Anionic surfactants	Surfactant	Cleans, removes dirt
	Heti Yleispesu	Anionic surfactants	Surfactant	Cleans, removes dirt

Appendix 4. Information about antimicrobial resistance

MRSP and MRSA ;Methicillin-resistant *Staphylococcus pseudintermedius* and *Staphylococcus aureus*.
ESBL; Extended-Spectrum Beta-Lactamase-producing Enterobacteriaceae, e.g. *Escherichia coli* or *Klebsiella sp*.

Antimicrobial resistant bacteria are becoming more common in Finnish animals. Although these resistant bacteria can be found on the mucosa or in the faeces of healthy animals, they are also capable of causing various types of infections. The extensive use of antimicrobial drugs increases the prevalence of resistant bacteria.

MRSP bacteria are canine and feline staphylococcal bacteria which have developed resistance to the most commonly used antimicrobial drugs for animals. Although MRSP bacteria can be found on the mucosa of healthy animals, they can also cause infections in the skin, ears and wounds, among others. ESBL bacteria are gut bacteria resistant to ordinary antimicrobials that are effective on infections caused by gram-negative bacteria. ESBL bacteria can cause, for example, urinary tract infections or wound infections.

At a veterinary reception, the spread of antimicrobial resistant bacteria can cause infections that are difficult to treat in patients, which is why it is essential to prevent the spread of such bacteria. Hygiene practices at a veterinary reception include identifying and taking samples from certain risk patients. Special precautions will be taken when treating your animal at the reception. Depending on the situation, the treatment staff will be using personal protective equipment and gloves when treating your animal. We ask that you please respond to these precautions with understanding. The special measures to be taken will not affect the quality or degree of treatment your animal will receive.

With regard to antimicrobial resistant bacteria, the following animals are classified as risk patients: animals that received hospital care earlier; patients that have been treated with several courses of antimicrobials; animals recently brought into the country from abroad; and patients with some type of bacterial infection. The objective is to identify carriers of resistant bacteria as early as possible, so that the spread of these bacteria can be prevented. The owner of a risk patient is responsible for the cost of taking samples.

Under normal circumstances, antimicrobial resistant bacteria do not pose a risk and are not more likely to cause infections in healthy animals. Engaging in activities or going outside with the animal does not need to be restricted to your home. However, it is recommended that the animals´ droppings be collected. There is no need to take any special precautions at home. However, if your animal has a skin infection or a suppurating wound, it is important that you observe good hand hygiene when handling the infected area.

If your animal is being treated at a different veterinary reception, we advise you to mention any findings of antimicrobial resistant bacteria so that they can be taken into account when treating your animal. Human and animal MRSA and ESBL bacteria are often the same. If a person handling animals every day requires medical attention, the treatment staff must be informed of this.

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2 Saariselvitys 2018
3 Uusi alku. Maatalous on myös tulevaisuuden elinkeino
4 Kansallinen rapustrategia 2017–2022
5 Keinoja orgaanisten lannoitevalmisteiden käytön edistämiseen
6 En ny början. Jordbruk är också framtidens näringsgren
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